

**TYPES 74-91A  
74-92A  
74-93A**

**FAIRCHILD**

**DU MONT LABORATORIES  
SCIENTIFIC INSTRUMENTS DEPARTMENT**

## Plug-In Spectrum Analyzers

**DC To 20 KC**

**DC To 100 KC**

**DC To 500 KC**

### FEATURES

- Manual sweep for exceptional accuracy
- Fits all Fairchild transistorized scopes
- Incidental FM less than 1%
- Vertical & horizontal output for X-Y recorder

### SPECIFICATIONS

These three Spectrum Analyzers demonstrate the almost limitless versatility of the Fairchild 766 series oscilloscope series. These analyzers are engineered to fit all existing units in the field. Fairchild builds no signal processing circuitry into its main frames. All operating circuitry is in a small plug-in container.

With two of these analyzers used with the 777 dual beam scope you can investigate two simultaneous spectrum displays at the same time on the same tube. This is especially useful for telemetry subcarrier oscillator analysis. One of the spectrum analyzers can be adjusted to observe the complete subcarrier frequency band. The other will allow a detailed narrow-band analysis of a particular section of the same band. Other uses include measurement of vibration, noise and distortion; harmonic and intermodulation distortion; sonar and subcarrier analysis; spectral and energy distribution and power level measurements.

While the center frequency dial accuracy of  $\pm 10\%$  is adequate for most applications, a manual sweep function has been added to allow frequency determination to an accuracy limited only by that of the external counter.

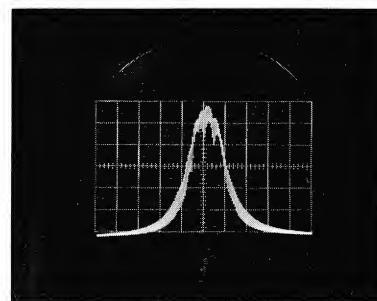
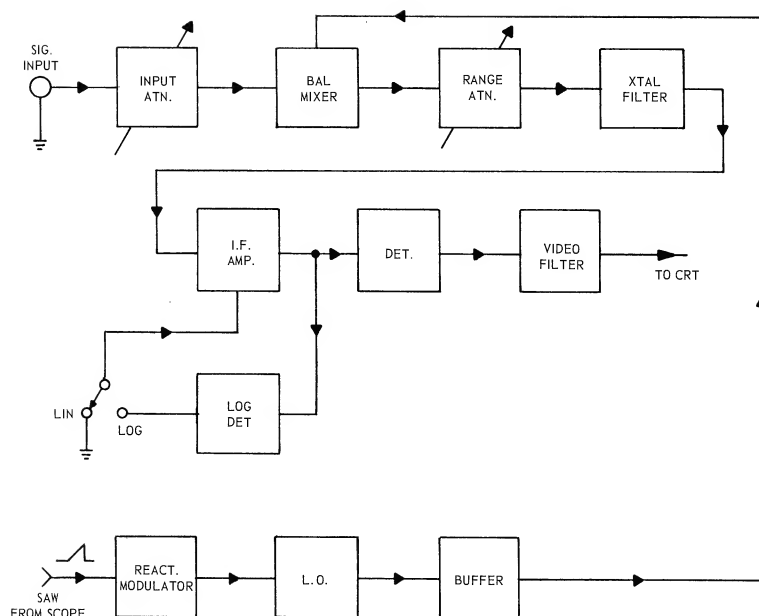
**Basic Theory of Operation** — Fairchild Plug-In Spectrum Analyzers are essentially high gain superheterodyne receivers, in which the local oscillators are repeatedly swept across a selected band of frequencies by means of an oscilloscope-derived sawtooth signal. In use, the analyzer will process complex signals and separate them into their frequency-versus-amplitude components.

The input signal is heterodyned with the local oscillator in the balanced mixer to generate an IF frequency. The mixer output is fed to the IF amplifier through narrow-band crystal filters. The IF amplifier is tuned to the difference frequency of the mixer output. The

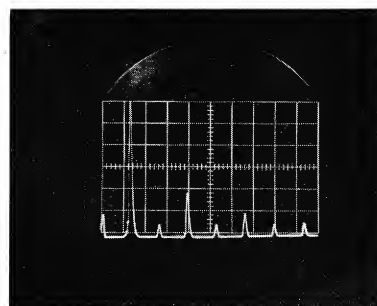


signal from the IF drives a detector, the output of which is the vertical component of the signal seen on the CRT. The IF amplifier can be operated in either a linear or logarithmic mode. In the log mode, db measurements are made directly from the CRT scale.

The input signal is converted into a frequency versus amplitude plot. With an input signal consisting of three frequencies, such as 290kc, 300kc, 310kc, the 300kc signal is twice the amplitude of the other two, which are equal. The local oscillator sweeps from 2mc to 1.5mc. The IF frequency is 1.5mc. When the difference between the incoming signal and the local oscillator is 1.5mc, a signal will be passed by the IF amplifier. An output will be generated only when the LO is at 1.79mc, 1.8mc and 1.81mc. With the amplitude of the 300kc signal at twice the amplitude of the 290kc and the 310kc signal, this two-to-one amplitude difference is observed on the scope screen. Reading the scope from left to right, the first output will be the 290kc signal; the second, the 300kc signal; and the third, the 310kc signal.



80kc carrier modulated at 35cps; maximum analyzer resolution.



1kc square wave spectrum showing fundamental and all harmonics.

**Center Frequency Dial Accuracy** –  $\pm 10\%$ .

#### Modes of Operation –

- Normal** Center frequency dial determines center of the band being swept
- Full Scan** Entire band displayed on CRT
- Manual** DC voltage used to sweep local oscillator and position CRT beam

**Dispersion Accuracy** –  $\pm 10\%$

**Display** – Input voltage amplitude scales  
Linear and 40 db logarithmic

**Sensitivity** – 45  $\mu$  volts/div deflection minimum

**Noise Level** – Less than 10  $\mu$  volts referred to input

**Amplitude Scale Accuracy** – Linear  $\pm 10\%$   
Log  $\pm 1$  db

**Amplitude Response Flatness** –  $\pm 1$  db

**Sweep Rate** – 0.2 sec/div. to 1 sec/div. continuously variable with front panel control

**Input Attenuator** – 80 db maximum in 20 db steps

**Input Impedance** – 1 megohm

**Dynamic Range** – Harmonic and Intermodulation products 60 db down

**Incidental FM** – Less than 1% of narrowest resolution bandwidth

**IF Attenuator** – 40 db maximum in 20 db steps

**IF Gain Control** – 20 db continuously variable

**Oscillator Output** – 1 volt p-p minimum from 4.7k ohms

**Video Filter (low pass)** – 50 milliseconds, selectable front panel switch

**Vertical Output** – -.05v/cm from 47k, DC coupled

**Horizontal Output** – 1 volt peak negative from 10k ohm DC coupled

**Compatible Oscilloscopes** – All Fairchild 765 and 765H series and 757 and 777 instruments

**Power Requirements** – All power and voltages from oscilloscope

| SPECIFICATIONS                                 | 74-91A          | 74-92A          | 74-93A          |
|------------------------------------------------|-----------------|-----------------|-----------------|
| Center Frequency Range                         | 10cps to 20kc   | 35cps to 100kc  | 150cps to 500kc |
| Calibrated Center Frequency Dial Range         | 0 to 20kc       | 0 to 100kc      | 0 to 500kc      |
| Dispersion (sweep width) Continuously Variable | 100cps to 6kc   | 500cps to 30kc  | 2.5kc to 150kc  |
| Resolution Bandwidth (continuously variable)   | 10cps to 100cps | 35cps to 250cps | 150cps to 2kc   |
| IF Frequency                                   | 100kc           | 262kc           | 1.5mc           |
| Oscillator Frequency                           | 120kc to 100kc  | 362kc to 262kc  | 2mc to 1.5mc    |
| Price                                          | \$820           | \$820           | \$820           |

Prices shown are U.S.A. Prices only. F.O.B. Clifton, N.J.  
Prices slightly higher outside the U.S.A.